WHAT IS CLAIMED IS:

1. A method for generating biomarkers specific for a known genus, species, or strain of a bioorganic compound selected from the group consisting of filamentous fungi, yeasts, molds, toxins of fungi, and pollen comprising:

(a) providing a sample comprising a known genus, species or strain of the bioorganic compound;

(b) placing an aliquot of said sample into a mass spectrometer;

(c) subjecting the sample to an ion source to produce charged molecular ions;

(d) propelling the ions into a mass analyzer to obtain a mass spectra;

(e) repeating steps (a)-(d) with at least one other non-identical sample comprising the same genus, species or strain of bioorganic compound;

(f) comparing the mass spectra obtained for each sample;

(g) identifying at least one peak on the spectra that is common to each sample; and

(h) assigning an m/z measurement of the peak as a genus, species, or strain specific biomarker.

2. The method according to claim 1 wherein the mass spectrometer is selected from the group consisting of linear or non-linear reflectron time-of-flight, single or multiple quadrupole, single or multiple magnetic sector, fourier transform ion cyclotron resonance, ion trap and combinations thereof.

3. The method according to claim 1 wherein the ion source is selected from the group consisting of laser desorption, fast atom bombardment, plasma desorption, electrospray ionization, or massive cluster impact.

4. The method according to claim 1 wherein the mass spectrometer is a time-of-flight mass spectrometer.

5. The method according to claim 4 wherein matrix assisted laser desorption ionization is used as the ion source.

6. The method according to claim 5 comprising the steps of:

(a) mixing a sample comprising a suspension of known genus, species or strain of the bioorganic compound with a matrix solution to generate a sample mixture;

(b) placing the aliquot of said sample mixture on the probe tip of the time-of-flight mass spectrometer and allowing it to dry;

(c) irradiating the dried aliquot with pulsed laser radiation to form charged molecular ions;

(d) accelerating the charged molecular ions by an electric field toward a detector through the flight tube of the time-of-flight mass spectrometer to obtain a mass spectra;

(e) averaging the mass spectra resulting from 10 to 500 laser pulses;

(f) repeating steps (a)-(e) with at least one other, nonidentical bioorganic compound comprising a suspension of the same genus, species or strain;

(g) comparing the averaged mass spectra obtained for each bioorganic compound;

(h) identifying at least one peak that is common to each bioorganic compound; and

(i) assigning an m/z measurement of the peak as a genus, species, or strain specific biomarker.

7. The method of claim 6 wherein the matrix solution comprises one or more organic acids in an aqueous solvent solution.

8. The method of claim 7 wherein the organic acids are selected from the group consisting of 3,5-dimethoxy-4-hydroxycinnamic acid, ∀-cyano-4-hydroxycinnamic acid and *trans*-4-hydroxy-3-methoxycinnamic acid.

9. The method of claim 7 wherein the aqueous solvent solution is an organic solvent selected from the group consisting of nitrites, alcohols, ethers, water and mixtures thereof.

10. The method of claim 7 wherein the organic acids are selected from the group consisting of 3,5-dimethoxy-4-hydroxycinnamic acid, ∀-cyano-4-hydroxycinnamic acid and *trans*-4-hydroxy-3-methoxycinnamic acid and the aqueous solvent solution is an organic solvent selected from the group consisting of acetonitrile, alcohols, water and mixtures thereof.

11. The method of claim 7 wherein the matrix solution further comprises aqueous trifluoroacetic acid.

12. The method of claim 10 wherein the organic acid and organic solvent are added in a ratio from about 70/30 (v/v) to about 30/70 (v/v).

13. The method of claim 6 wherein the pulsed laser radiation is provided by a 337nm nitrogen laser.

14. The method of claim 6 wherein about 10 to about 100 spectra are averaged.

15. A method for determining the genus, species and/or strain of an unknown bioorganic compound which comprises:

(a) generating a mass spectrum of the unknown bioorganic compound according to steps (a)-(d) of claim 1; and

(b) comparing the mass spectrum of the unknown bioorganic compound to a plurality of genus, species or strain specific biomarkers, said biomarkers being generated according to claim 1.

16. A method for determining the genus, species and/or strain of an unknown bioorganic compound which comprises:

(a) generating a mass spectrum of the unknown bioorganic compound according to steps (a)-(e) of claim 6; and

(b) comparing the averaged mass spectrum of the unknown bioorganic compound to a plurality of genus, species or strain specific biomarkers, said biomarkers being generated according to claim 6.

17. The method of claim 16 wherein the matrix solution comprises one or more organic acids in an aqueous solvent solution.

18. The method of claim 17 wherein the organic acids are selected from the group consisting of 3,5-dimethoxy-4-hydroxycinnamic acid, ∀-cyano-4-hydroxycinnamic acid and *trans*-4-hydroxy-3-methoxycinnamic acid and the aqueous solvent solution is an organic solvent selected from the group consisting of nitrites, alcohols, ethers, water and mixtures thereof.

19. The method of claim 18 wherein the matrix solution further comprises aqueous trifluoroacetic acid.

20. The method of claim 16 wherein the pulsed laser radiation is provided by a 337nm nitrogen laser.

21. The method of claim 16 wherein about 10 to about 100 spectra are averaged.

22. A biomarker library for identifying the genus, species and/or strain of an unknown bioorganic compound selected from the group consisting of filamentous fungi, yeasts, molds, toxins of fungi, and pollen, the library comprising genus, species or strain specific biomarkers for known bioorganic compounds generated by the method of claim 1.

23. A biomarker library for identifying the genus, species and/or strain of an unknown bioorganic compound selected from the group consisting of filamentous fungi, yeasts, molds, toxins of fungi, and pollen, the library comprising genus, species or strain specific biomarkers for known bioorganic compounds generated by the method of claim 6.

24. The library of claim 22 wherein the genus, species and/or strain of fungi used is selected from the group consisting of *Phycomycetes, Ascomycetes, Neurospora, Aspergillus, Penicillium, Basidiomycetes, Deuteromycetes , Acremonium spp., Alternaria spp., Arthrinium spp., Aureobasidium spp., Beauveria spp., Bipolaris spp., Borytis spp., Chaetomium spp., Chrysonilia spp., Cladosoporium spp., Cunninghamella spp., Curvularia spp., Drechslera spp., Emmonsia spp., Epiccoccum spp., Fusarium spp., Humicola spp., Microsporum spp., Mucor spp., Myceliophthora spp., Paecilomyces spp., Pithomyces spp., Rhizomucor spp., Rhizopus spp., Scopulariopsis spp., Thielavia spp., Trichoderma spp., Ulocladium spp.* and *Verticillium spp.*

25. The library of claim 22 wherein the pollen used is selected from the group consisting of *Sorghum spp., Secale spp., Poa spp., Cynodon spp., Dactylis spp., Agrostis spp., Zea spp., Ulmus spp., Juglans spp., Populus spp., Juniperus spp., Fraxinus spp., Betula spp., Alnus spp., Acer spp., Kochia spp., Iva spp., Artemisia spp.,* and *Ambrosia spp.*